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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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A SCIENCE SERVICE PUBLICATION

PUBLIC HEALTH

Atomic Age Public Health

RADIATION HEALTH HAZARDS will be explored at the world's first Department of Radiological Science at Johns Hopkins University.

"The school will be concerned with all aspects of the radiation health picture; and its aim will be to train radiological health specialists and researchers for both national and international service," Dr. Russell Morgan, who will head the department, told SCIENCE SERVICE. A specialist in radiological medicine, Dr. Morgan is chairman of the National Advisory Committee on Radiation to the U. S. Public Health Service.

Dr. Morgan credits Dr. Milton Eisenhower, president of Johns Hopkins, for "pulling out all stops" to get the program started.

"He is extremely interested in this field of research and dedicated to the goal of producing graduates in public health qualified for the responsibility of guarding the health of the nation and, indeed, the world."

The department will operate within the Johns Hopkins School of Hygiene and Public Health, the first of its kind when it was set up nearly half a century ago. It has been the forerunner and model for 15 similar schools in North America and 20 others throughout the world.

Dr. Morgan predicted that the new plant and program also will serve as a model here and abroad. He labeled the health effects of radiation "the biggest biological problem of the atomic age and, perhaps, the greatest challenge to the field of public health."

Radiological science at the University will deal with the problem of food contamination from radiation, searching for new methods to remove this hazard. It also will concentrate on fundamental research "to better determine the extent and consequences of the reaction of radiation on the biological system and environment." Another area will deal with practical application of research studies in the field of public health.

Estimated costs of the new laboratory to be built, equipment and personnel are $2,000,000.

"We hope to keep the classes small for the best reason. . . . We are interested in turning out quality rather than quantity," Dr. Morgan said. "The technical nature of the problems involved as well as research to be explored requires that the students in this department have advanced knowledge in engineering, medicine, biophysics, and be in the top level scholastically."

The graduates will be the leaders in radiological health. "I foresee a sizable demand for these health specialists both here and in the underdeveloped countries where nuclear power will be needed," he declared. "The scope for their service is limitless."

• Science News Letter, 78:82 August 6, 1960

PUBLIC HEALTH

Low Jet Fallout Levels

RADIOACTIVE FALLOUT, regarded as a potential danger to the air traveler in the jet age, has been under continuous study by the U. S. Public Health Service for the past two years.

Fortunately for both jet flight enthusiasts and commercial jet airlines, the levels of fallout accumulating on jets in flight are low and present "no significant increases in the radiation exposure of the crew and passengers."

The special projects branch of the PHS division of radiological health reports that tests of air samples inside the jets during flight revealed that radiation in the aircraft's interior does not exceed that of normal background.

"As a matter of fact," a PHS official said, "the metal surfaces of the plane seem to provide passengers and crew inside with an effective shield from the areas of higher radiation through which the jet passes in flight."

Greatest exposure appears to be occupational, involving maintenance personnel working around the aircraft while it is on the ground after flight. However, even here the radiation exposure levels are sufficiently low to require no more than simple decontamination procedures.

Radioactive particles do not accumulate uniformly on the entire surface of the jets. The "hot spots," or areas of significant contamination, are those passing large volumes of air, such as the turbine blades, front frame and propeller blades, and regions where grease settles.

The contaminated surfaces are easily and safely cleaned with a solvent and then may be washed with a detergent and water. Levels of contamination are sufficiently low to permit decontamination crews to work without special protective clothing.

The PHS study followed research by the Atomic Energy Commission, the Air Force and the Federal Aviation Agency showing that the altitude levels of high-flying jets exposed them to greater amounts of radiation than the lower altitude levels of conventional aircraft.

This is because jets travel commonly in that part of the upper atmosphere or stratosphere where radioactive debris may remain from less than a year to several years. These findings have been substantiated more recently by the fallout pattern studies of the Lockheed U-2 airplanes of the type downed by the Russians on May 1.

Pan American World Airways jet planes were used by the Public Health Service for the survey and testing required by the study. PHS credits the medical department of PanAm with providing numerous and essential smear samples from the exterior surfaces of their jets as well as its own independent analyses, which were given to PHS.

Several other airlines in this country, following the lead of PanAm, now have offered the PHS similar service and cooperation on demand.

The PHS, with PanAm and other commercial and Government establishments, is continuing its contamination studies on jets in order to provide the public with full protection against any radiation hazards from jet flight that may develop in the future.

Public Health authorities expect no appreciable increase in radiation levels on jets unless there is a resumption of nuclear weapons' testing.

• Science News Letter, 78:82 August 6, 1960

MATHEMATICS

Formula Devised for Fallout in Buildings

A MATHEMATICAL METHOD for computing the levels of radioactive fallout inside buildings has been developed at the National Bureau of Standards.

The formula, with further refinement, will make better fallout shelter design possible.

Using a detector at the center of the structure, the formula calculates intensities within basements, the amount of radiation entering through windows, how much comes through roofing as distinguished from that coming through walls, and the barrier to radiation offered by flooring and inner partitions.

The method is the result of a study by Charles M. Eisenhauer and Dr. Lewis V. Spencer of the Bureau. They worked under the sponsorship of the Office of Civil and Defense Mobilization.

The Bureau expects the formula to shed new light on the behavior and effect of scattered radiation in shelters. Heretofore scattered radiation has been difficult to calculate, although it is known to vary with wall thickness.

The intensity, or dose rate, of fallout within a structure or building depends upon the thickness and density of the walls. The dose rate for direct radiation is now known.

With the formula, radiation emerging from thin walls can easily be computed by multiplying the formula's barrier factor by the geometry factor for the direct radiation. In estimating the intensity through thick walls, the barrier factor is multiplied by the geometry factor for scattered radiation.

A controlled experiment at the Army Chemical Warfare Laboratories using cobalt-60 sources around a concrete blockhouse, taking data at the center of the eight-foot-high structure at various heights from ground level to six feet above ground, has verified the trends determined by the new method of calculating interior fallout.

• Science News Letter, 78:82 August 6, 1960

GENERAL SCIENCE

Candidates on Science

The presidential candidates give their views on science and technology. Nixon emphasizes need to train scientists and educate public. Kennedy discusses automation.

Nixon Statement

NEED FOR SCIENCE EDUCATION for the public is critical and urgent, Vice President Richard M. Nixon told SCIENCE SERVICE.

A general public with "a high degree of scientific literacy" is as necessary for the maintenance of the national scientific effort as are highly trained scientists and engineers, he said.

Science and technology play an increasingly important role in political, economic and social areas. Public understanding of the interrelationship is essential for "sound, long-term national policies and programs." The Vice President stressed the importance of achieving balance in education in the fields of both science and the humanities in order to produce citizens capable of meeting the challenge of this new age.

Following is the complete text:

Nothing could be more obvious than the impact of science and technology on our national life—indeed, on our very survival.

But because our attention is focused so largely on the dramatic and the spectacular —on satellites and missiles and space exploration—we may tend to lose sight of the almost routine interrelation of scientific advance and our day-to-day lives: in the fields of health and nutrition, communications of every form, business and industry, and all the processes of an abundant and productive living standard. The potentials opened to us by science and technology—for our material convenience and our cultural growth—are limitless.

This close and constant interrelationship raises two great problems for all of us. The first, of course, is the critical need to train scientists and engineers, skilled in the latest developments of this new and revolutionary age and prepared to push still farther ahead.

But there is a second and equally important area of concern. We also need scientific education for the general public. If our national scientific effort is to be maintained, the American people must have deeper motivations than simply a desire for immediate practical benefits. This new age will require of the public generally a high degree of scientific literacy and the blending of science into our total culture and way of life.

Increasingly, major national decisions—political, economic and social — involve scientific and technological decisions. Obtaining adequate public support for projects with obvious military value is relatively easy. But we need a high level of public understanding to develop sound, long-term national policies and programs.

It is not a question of making every citizen into a scientist: what we must try to do is provide for the nonscientists the insight and understanding with respect to science that we have historically sought to give all our citizens in the general field of the humanities. What we need is continued public support for basic research.

This will require a judicious sense of balance. We must avoid turning out future generations of scientific materialists or automatons. By balancing scientific and humane education, our aim must be men and women in every field who are ready to assume the total responsibilities of citizenship in a free society.

This, I find, is a view which is held by all our top scientists. They well recognize the need for highly trained scientists and engineers if we are to maintain our position of world leadership.

But we must not and will not depend on forced-draft or on arbitrary selection. The scientists and engineers who have contributed so much to America's greatness chose their careers freely. They realized the importance of this work; they were challenged by its vast frontiers; they saw its opportunities and were willing to undergo the rigorous preparation. They made their choice with greater freedom than is allowed anywhere else in the world.

This is the crucial ingredient of America's scientific and technological greatness up to now—and so it must continue to be.

Kennedy Statement

THE REPLACEMENT of men by machines is the "challenge" of "a new industrial revolution — the revolution of automation," Democratic presidential nominee Sen. John F. Kennedy (D.-Mass.) told SCIENCE SERVICE.

The advance of automation, said the Senator, is threatening thousands of jobs and entire plants, and is creating fear among workers and their families.

"It is menacing the existence of entire communities," he stated.

The threat of automation, however, can be turned into "the key to a brighter future" if labor and management and Government "work together to ease the inevitable dislocations and hardships which this new industrial revolution will bring."

The Democratic leader indicated that the challenge of technological progress can be met with Federal help and planning which would assure increased productivity by automation while at the same time "providing new jobs and new hope for the victims of industrial advance."

Sen. Kennedy expressed his faith in labor's support for technological advances even though they may threaten jobs.

"No one wants to work the old, back-breaking way if there is an easier way to do the job. No worker and no labor leader wants to stand in the way of America's economic growth," Sen. Kennedy said.

His complete statement follows:

Today we stand on the threshold of a new industrial revolution—the revolution of automation. This is a revolution bright with the hope of a new prosperity for labor and a new abundance for America—but it is also a revolution which carries the dark menace of industrial dislocation, increasing unemployment, and deepening poverty.

Already entire automobile engines are being manufactured, untouched by human hands. Modern lathes and drills are turning out parts machined to the closest tolerances, guided only by electrical impulses which make the settings and automatically correct all errors. Electronic equipment is sorting material as it enters a warehouse and carrying it—without human guidance —to its proper place of storage. And in the future, as the complexity, the versatility, and the precision of modern technology continue their inevitable advance, thousands of processes and functions now performed by men will be done, more cheaply and more efficiently, by machine.

These revolutionary changes in the nature of our industrial system are a challenge to our leadership, our vision and our resourcefulness. For the steady replacement of men by machines—the advance of automation—is already threatening to destroy thousands of jobs and wipe out entire plants. It is creating fear among workers, and among the families of workers. It is menacing the existence of entire communities. And it can create poverty and want and even hunger—as it has already done in the coal mines of West Virginia where I saw the sad spectacle of men, displaced by machines, unable to find work, unable to shelter their families, and unable to feed their children—the forgotten children of the richest country in the history of the world.

But this is not the inevitable product of advancing technology. We have not created new machines so that they can destroy our prosperity and our economic health. Today —as we have done in the past—we must translate our skill and our inventive genius into abundance and strength and a better life for all Americans.

Only because advancing knowledge has been adapted to the production of goods, are washing machines, and television sets, and automobiles and electric lights and a thousand other products, now within the range of the average income. And only because of new discoveries do we enjoy the unparalleled luxury of being the first nation ever to worry about an overabundance of goods. The history of man's economic progress has been the history of such discoveries: Looms replaced hand weavers. Electric motors replaced human muscle. Bulldozers and hydraulic lifts

(Continued on p. 93)

ROCKETS AND MISSILES

Reports on Missile Range

THE OPERATION and management by private industry of the Atlantic Missile Range at Cape Canaveral was investigated by Congress.

The important Air Force installation for several years has been managed by Pan American World Airways. The inquiry by Rep. Victor L. Anfuso (D.-N.Y.) for the House Committee on Science and Astronautics was prompted by reports of alleged "irregularities and inefficiencies in range management." Another reason was to determine whether it might not be better and more economically managed by the Air Force and Civil Service.

When the Pan American management contract originally was made with the Air Force, Roger Lewis, now a vice president of Pan American, was assistant secretary of the Air Force. Shortly after the contract was negotiated, he resigned from Government to assume his position with Pan American, which he still holds.

Rep. Anfuso reported an air company official said that Mr. Lewis has "no direct connection with AMR."

Millions already have been invested in range facilities and equipment at the Atlantic Missile Range, or AMR. A Department of Defense management study indicates that AMR's potential for expansion and development is practically complete, and that the installation already is "substantially saturated with missile launching facilities." The Defense study indicates that private management of the missile range did not involve significant cost differences, but that the expansion probably was done more efficiently under Pan American than it would have been done by the Government.

The Defense findings have been substantiated by Rep. Anfuso, who has stated that under Pan American, "AMR is now being successfully managed and operated," and "that Pan American contract management has not been significantly more expensive than alternative management arrangements . . ."

The Congressional report states that industrial management "especially in the early years" of AMR development "has probably been more effective." However, it recommends "a close and continuing watch on AMR" and a careful review of present management arrangements within a year.

• Science News Letter, 78:84 August 6, 1960

MEDICINE

Lie Detector Helps Heart

THE LIE DETECTOR, presently an outlaw in the courtroom, has found new favor with the medical profession. The detector or polygraph may be able to predict likely candidates for coronary heart disease.

Drs. Meyer Friedman and Ray H. Rosenman, of the Harold Brunn Institute, Mount Zion Hospital and Medical Center in San Francisco, report that the typical "go-getter" has clinical coronary heart disease seven times as often as "normal" persons.

This patient usually has certain telltale mannerisms such as rapid, frequently forced and audible intake of breath; explosive intonation or emphasis or certain individual words in sentences; tense facial and body muscles; frequent fist clenching during ordinary conversation; and consistent tendency to hurry the pace of ordinary conversation by finishing the other person's sentences or by rapidly uttering such phrases as "yes, yes," or "I see, I see."

This characteristic behavior pattern is sometimes consciously or unconsciously camouflaged by the patient, or the doctor may overlook it.

The problem is to find some way of measuring those stress reactions that a patient does not voluntarily control. The lie detector may be the answer.

The doctors selected a group of 20 persons suffering from coronary heart disease, another group of 15 normal persons and a third group of seven persons with functional cardiovascular disease. Each underwent a polygraph test while listening to a tape recording of interrupted monologues designed to cause irritation.

The results showed that the coronary disease patients were clearly differentiated from the other two groups by a rapid rise in the respiratory wave when inhaling, by a greater expansion of the upper as compared to the lower half of the chest, by a threefold greater incidence of respiratory deformities, by a twofold greater incidence of body movements and by a frequent clenching of hands.

Anyone who takes this test and shows two or more of these criteria, the doctors assert in the Journal of the American Medical Association, 173:1320, 1960, probably has "overt behavior pattern A"—the go-getter. This does not mean he has or will have coronary heart disease. It just means his chances are greater.

The lie detector is one way for an untrained observer to detect behavior pattern A, and this may lead to mass predictive studies, the doctors conclude.

• Science News Letter, 78:84 August 6, 1960

PSYCHIATRY

Troubled Boss Imparts Feelings to Subordinates

A TROUBLED BOSS may communicate his feelings to his subordinates, who in turn pass them on with an increase in intensity.

An editorial in the Journal of the American Medical Association, 173:1361, 1960, based on a pamphlet of the American Psychiatric Association titled "Troubled People on the Job," says in part:

"Emotional disturbance is known to pose a serious threat to business in this country. Emotional tensions among employees result in absenteeism and in accidents on the job. A frequent complaint or justification for absenteeism is attributed to the common cold, headache, migraine and gastrointestinal disturbance.

"These excuses, although generally accepted, are probably more often direct effects of managerial mismanagement or misconception of supervision. . . . A boss who is troubled with anxiety, hopelessness, irresponsibility, hostility or anger may communicate these feelings to his subordinates, who in turn pass these reactions along, frequently with an increase in intensity."

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BIOCHEMISTRY

Testosterone Measured

By changing testosterone from a male to a female hormone, scientists can measure it. This should lead to an understanding of certain musculinizing diseases.

THE AMOUNT OF TESTOSTERONE, a male sex hormone, in human blood can now be measured by changing this substance to a female hormone.

This is expected to help give an understanding of certain types of masculinizing diseases in women and young girls, and to explain precocious puberty in boys. It will also present a method for studies of normal male puberty, and the loss of the sexual function in older men. It should also aid in the diagnosis and evaluation of certain diseases related to the testes, the ovaries and the adrenal glands.

Dr. Ralph I. Dorfman, director of laboratories at the Worcester Foundation for Experimental Biology, Shrewsbury, Mass., told SCIENCE SERVICE at the First International Congress of Endocrinology in Copenhagen that the method of measuring testosterone was a result of team work done by his co-workers, Drs. Michael Finkelstein, Enrico Forchielli and himself.

Since the concentration of testosterone in the blood is extremely small, Dr. Dorfman said, it was necessary to partially isolate the testosterone and convert it to a female sex hormone, estradiol, by means of an enzyme derived from the human placenta. Estradiol can then be determined in the blood by an exceedingly sensitive color reaction with concentrated phosphoric acid, Dr. Dorfman said.

The concentration of estradiol found in the blood is 1.5 micrograms per liter of human male blood, it has been found.

Whenever the male sex hormone is a dominant factor in human development or disease, the activity is due to testosterone. Although testosterone is the most active of all the male sex hormones, it is present in body fluids at the lowest concentration of all the male sex hormones.

Until now there has been no method for measuring the concentration of testosterone in the blood.

• Science News Letter, 78:85 August 6, 1960

BIOCHEMISTRY

How to Adjust Abnormal Hormone Secretion

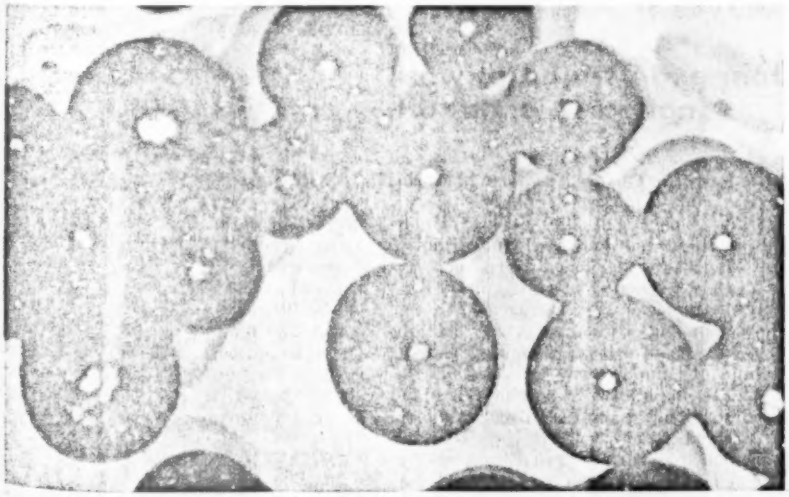
A NEW APPLICATION of an older principle may help doctors understand how to adjust abnormal levels of hormone secretion in cases of illness, pregnancy and infertility, Dr. Ejgil Bojesen, head of the division of endocrinology at the University of Copenhagen, told SCIENCE SERVICE.

Dr. Bojesen said that scientists in his division have succeeded in measuring steroid hormones in the blood that are present only in very minute quantities. This was not possible until an analytical principle based on isotopes first developed in the United States was used, he said.

Dr. Bojesen called this principle the isotopic derivative method. He said it was applied to steroid hormones in the blood because it is more sensitive and possibly more specific than other analytical methods. However, he said, it is difficult and expensive.

As a result of using this method for measuring the steroid hormones in the blood, it will be possible to find out more about the mechanism that regulates the hormone secretion rate.

• Science News Letter, 78:85 August 6, 1960



THRUST IMPROVER—A process for producing spherical powders has been developed by the Linde Co., a division of Union Carbide Corp. Powders of metals and metal alloys, such as tungsten, shown above at 100 magnification, can be used as additives to improve thrust of solid rocket fuel propellants. Spherical powders may also improve burning stability and reduce handling sensitivity.

GEOLOGY

Natural Cement May Ruin Bathing Beaches

A RELATIVELY UNKNOWN geological formation may be threatening valuable bathing beaches around the world. Dr. Richard J. Russell, director of the Louisiana State University Coastal Studies Institute, has reported that sand, gravel, boulders or anything else that happens to be in tropical or subtropical beaches somehow become tightly cemented with a form of calcium carbonate or lime and form rock-like strips beneath the surface of beaches. When this "beach rock" becomes exposed, it can ruin swimming beaches.

Dr. Russell began studying beach rocks in 1956 while in the Caribbean on another research project and he has been studying them ever since.

• Science News Letter, 78:85 August 6, 1960

ROCKETS AND MISSILES

Spherical Powders May Boost Rocket Propellants

SOLID FUEL ROCKET propellants may get a boost from spherical powders of metals and metal alloys with particles ranging in size from 20 to 150 microns and free from such defects as voids, cavities and inclusions. A process for producing spherical powders has been developed by the Linde Co., a division of Union Carbide Corp.

Since solid rocket fuel propellants gain significant additional thrust from additives such as aluminum, the use of spherical powders as additives may improve burning stability and reduce handling sensitivity as well.

Spherical powders are used, in the main, where their uniform spherical shape is an advantage. For example, such powders may be used to fabricate sintered bodies requiring controlled porosity. This suggests use in filters, burner plates, porous piston rings and sweat cooled nozzles.

The company now has a total of six different powders available in limited quantities—these include copper, aluminum, nickel and tungsten.

It is also pointed out that highly reactive powders may be handled with less hazard when they are in spherical shape, and have as a result the lowest possible surface-to-volume ratio.

In the laboratory, spherical powders can be very accurately separated into various particle size ranges. Since most particle size analyzing equipment assumes that all powder particles are spherical, a sample of spherical powder can be used as a standard to calibrate the equipment.

• Science News Letter, 78:85 August 6, 1960

MEDICINE

Abortion Facts Reported

The medical director of the Planned Parenthood Federation of America, Inc., charges that illegal abortion is a disease of society, recommends solutions.

ILLEGAL ABORTION is a "disease of society," a New York doctor charges. The only way to cure the disease is to bring it out of hiding and look at it with a view to correcting this social illness.

Almost every illegal abortion is preceded by a visit of the woman to some doctor with a request for a legal abortion, Dr. Mary Steichen Calderone, medical director of the Planned Parenthood Federation of America, Inc., New York, believes. Such requests are almost always turned down and the woman turns to an illegal abortionist.

Although officials will probably never find out how many illegal abortions have been performed, they might get some idea if doctors reported every request for legal abortion to their local public health officers, and Dr. Calderone is urging that this procedure be given a try.

A number of facts about abortion have been unearthed by a study panel of 43 experts in medicine, law, sociology and demography.

In 46 states, legal abortion is permitted to preserve the life of the mother. Three states also allow it to preserve the mother's health. In the other states therapeutic abortions are peformed when a psychiatrist believes that the unwilling mother will otherwise commit suicide.

Interpretation varies from city to city, from hospital to hospital within the city, and from service to service in the same hospital. The border zone between legal and illegal abortion is narrow and shifts frequently. One expert studying the problem defined the difference between the two as "$300 and knowing the right person."

"What we have to admit," Dr. Calderone reports, "is that most therapeutic abortions are in the strictest sense of the law actually illegal."

Abortion is no longer a dangerous procedure, whether legal or illegal. An estimated 90% of the illegal ones are performed by physicians, using sterile procedures. The trouble usually comes from those who attempt self-induced abortion or go to a non-medical abortionist.

Reputable physicians refer their patients to colleagues whom they know are willing to perform illegal abortions, or send them to a foreign country where abortion is performed under sanitary conditions, she said.

In the United States the frequency of illegally induced abortions may be between 200,000 and 1,200,000 annually. In 1957, 260 deaths were recorded from all types of abortion in the U. S.

Requests for therapeutic or legal abortions come from married and unmarried women in about equal proportions.

There are three ways to begin alleviating the problem, Dr. Calderone reports in the American Journal of Public Health, 50:948, 1960.

First, prevent the need for abortions by providing contraceptive means to any woman who wants it, each according to her own religious beliefs.

Second, encourage a higher standard of sex conduct and responsibility toward pregnancy by early, continued and realistic sex education.

Third, have doctors report requested abortions to local health officials who might then get a better idea of the problem. The patient's name should, of course, be withheld.

The foreign countries have their problems too. In France, a Catholic country, the law requires that every pregnancy be reported to the police. Abortions and contraceptive measures are illegal. The abortion rate is estimated as one for every live birth.

In Japan, where a strong governmental contraceptive program is in operation, and where legal abortion can be performed by almost any physician for two or three dollars, the over-all abortion rate is about the same as in France.

In the Scandinavian countries abortion applications are considered by medical boards operating under government auspices. Medical, psychiatric and sociological aspects are considered. Contraception is widely available. Yet even these countries admit to some illegal abortions.

These situations in the various foreign countries point up the fact that an unwilling pregnant woman will obtain an abortion, whether legally or illegally.

• Science News Letter, 78:86 August 6, 1960

AERONAUTICS

FAA Developing Light Beacon Transponders

AIR TRAFFIC CONTROLLERS will be afforded a method of positive identification of business and private planes with small, inexpensive radar beacon transponders, being developed for the Federal Aviation Agency. Transponders are now being used in all jet and some large transport planes.

The instrument permits an aircraft to send a coded message that is displayed on a radar screen, definitely identifying it to the controller. The development of a small, light, inexpensive and low-power-drain transponder would permit use of the equipment by general purpose aircraft, making traffic control by radar faster and safer.

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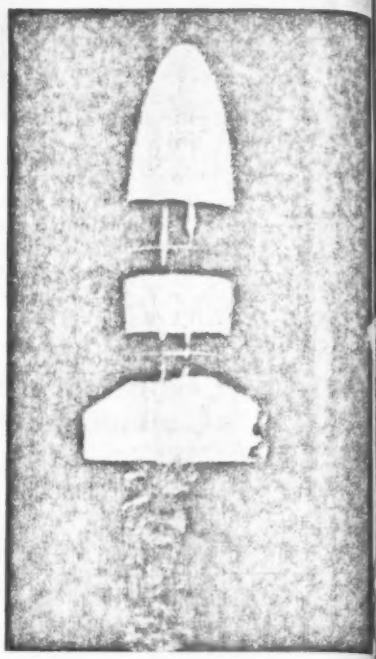


MISSILE MODEL EXITS — The high-speed photo of missile-shaped body after passage through water-air boundary shows that considerable water exits with missile, although there is only slight effect on speed or direction. Tests made at the University of Illinois.

RADIO ASTRONOMY

No Messages to Space From Radio Telescope

THE LARGEST RADIO TELESCOPE in the world will not be used either to send or try to receive radio messages from intelligent beings on planets of other suns, Prof. A. C. B. Lovell, director of the University of Manchester's Jodrell Bank Experimental Station, told SCIENCE SERVICE.

A program of listening for possible radio messages from other intelligent life, called Project Ozma, was attempted this spring with the 85-foot radio telescope at Green Bank, W. Va.

Prof. Lovell said in London that no such program is planned for the 250-foot radio telescope at Jodrell Bank. The 250-foot disc is now being used both for space-tracking and astronomical studies, Prof. Lovell said. The space-tracking takes up about ten percent of the radio telescope's time.

The remaining 90% of its time is divided between cosmological studies of unidentified radio sources in the universe and a survey of some galaxies in the neighborhood of the Milky Way galaxy, in which the sun and planets are located.

Dr. Lovell said that the radio astronomers at Jodrell recently tracked a radio source six billion light years away, or 36 million million billion miles. He said it was moving away with about half the speed of light.

• Science News Letter, 78:86 August 6, 1960

BIOLOGY

Clue to Living Cells

LARGE SYNTHETIC MOLECULES may give a clue to the structure and operation of living cells.

Synthetic molecules behave in a manner similar to important natural molecules, Prof. A. Katchalsky, vice president of the Israel Academy of Sciences and Humanities in Jerusalem, told SCIENCE SERVICE.

These large molecules, called macromolecules, are made up of smaller ones strung like beads on a string.

The development of synthetic macromolecules was a real industrial breakthrough and led to the manufacture of plastics, synthetic fibers and synthetic rubber.

However, Prof. Katchalsky, a physical chemist, said that cell structure, underlying that of all living beings, is also based on special macromolecules.

By studying the behavior of simple synthetic macromolecules, which dissolve in water and have electrical properties, scientists may learn more about the organization of living organisms and the properties of cells.

Prof. Katchalsky and his co-workers discovered that several of their synthetic macromolecules may contract or expand when reacting chemically.

This contracting ability of man-made materials illuminates the origin of movement in living beings, including contraction of muscles.

Prof. Katchalsky stressed that the synthetic macromolecules are only models from which to learn the fundamental principles governing the behavior of cells. The ultimate goal of his research is the study of natural macromolecules.

He said that the synthetic macromolecules may possibly help explain the action of certain defense mechanisms of the body.

The synthetic macromolecules might act in the body as a new type of drug, and might help fight some blood diseases since certain blood diseases are due to malfunction of natural macromolecules.

Prof. Katchalsky, an official guest at the Royal Society's Tercentenary Celebration in London, said that the Israel Academy of Sciences and Humanities is less than a year old and has been operating for only six months.

• Science News Letter, 78:87 August 6, 1960

BOTANY

Natural Antibiotic Controls Plant Fungus

A NATURAL ANTIBIOTIC in plants that helps protect the plants against fungus has been found by a team of scientists, Prof. Ralph L. Wain of the University of London said at the Royal Society's Tercentenary Celebration.

Prof. Wain said that he does not yet know exactly what this antibiotic substance is, but its composition is now being investigated.

He said that his team generally studies plant growth hormones. Some of these chemicals will kill plants when applied and these are used in weed control.

Dr. Margaret S. Smith, one of Prof. Wain's team, explained that they are studying systemic fungicides that will move through plants and prevent fungus from attacking the plant.

The team is also checking to determine if plants produce any substances that protect them from fungus attack. So far the scientists have discovered the one natural antibiotic that the plant uses as a defense against fungus. The antibiotic has not yet been named.

• Science News Letter, 78:87 August 6, 1960

BIOLOGY

Is Life on Earth Just Beginning?

"WHERE DID I COME FROM? How did life begin?"

These are questions asked both by children and scientists; but no answers yet have been found to satisfy either group.

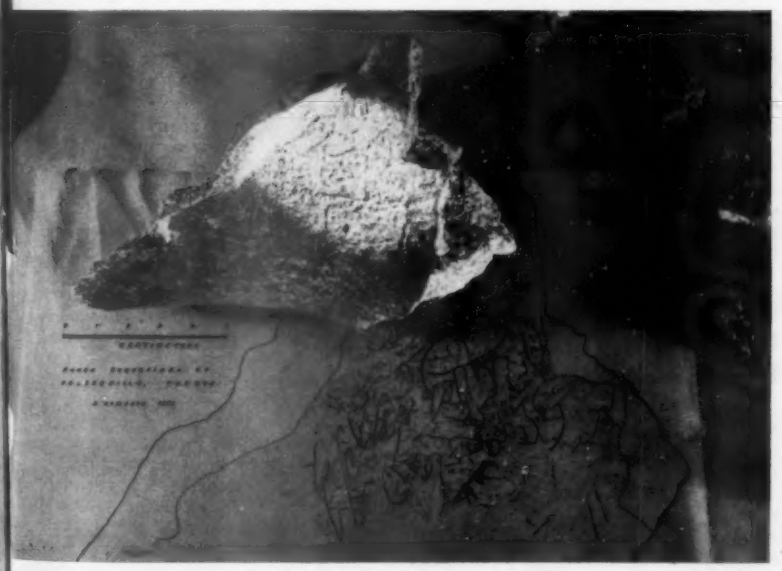
Research, controversy and theory on the subject are explored in Science, 132:200, 1960, by Dr. Sidney W. Fox of the chemistry department, Florida State University, Tallahassee. The range is from Darwin's theory of evolution to the current attempt to produce a living cell synthetically.

Adding to the confusion surrounding the search is the thought, suggested by the author, that even now life may be just beginning.

"Although we can with certainty say only that life arose at least once, there is increasing reason to believe that life can, or even must, arise in many places at many times."

Dr. Fox suggests the possibility that "we fail to recognize life beginning anew because it so resembles unevolved descendants of primitive forms already here."

• Science News Letter, 78:87 August 6, 1960



ANCIENT PELVIC BONE—This mastodon bone, which may be 30,000 years old, was discovered by Dr. Juan Armenta Camacho in the Valley of Puebla, southeast of Mexico City. It has carved upon its surface figures of horses, camels, mastodons and other animals—the earliest human drawings found in this hemisphere.

ANTHROPOLOGY

Mastodon Bone Drawings May Be 30,000 Years Old

A MASTODON PELVIC BONE with what look like drawings of now extinct animals scratched on its surface may push back man's known existence in the Americas to as much as 30,000 years ago.

The bone was found in the Valley of Puebla, southeast of Mexico City, by Dr. Juan Armenta Camacho, anthropologist at the University of Puebla, Mexico. From preliminary tests on the bone, Dr. Armenta believes it to be more than 30,000 years old.

Previously, the earliest well-established date for man in America was in the neighborhood of 10,000 years. Some finds have been made that were believed to be older but evidence has always been lacking that would pin down the date to the satisfaction of scientists.

Dr. Armenta has submitted several specimens from among his finds to Dr. James B. Griffin of the University of Michigan's Museum of Anthropology for dating with the radiocarbon method, but Dr. Griffin has not yet had time to make the tests.

Report of the ancient finds is contained in a Spanish-language Latin American magazine, Vision, July 29, 1960.

• Science News Letter, 78:87 August 6, 1960

BIOLOGY

Light Variations Affect Rabbit Reproduction

SEASONAL VARIATIONS in light apparently cause rabbits to reach their peak of reproductivity in spring.

This concept, suspected by scientists for some time, has been bolstered by additional evidence from the laboratory of Dr. Charles H. Sawyer of the University of California Medical School, Los Angeles.

Some scientists had thought that temperature conditions induced the female rabbit to release its eggs, as a part of the mating sequence, most readily in late winter and spring. Dr. Sawyer's studies show, however, that this tendency is the same in California's year-around mild climate as in areas where there are seasonal climatic extremes.

He was able to induce spontaneous ovulation in the rabbit by injection of the female sex hormone, estrogen, in winter and spring but not in summer or autumn.

This suggests that the nervous system, which controls release of certain hormones from the pituitary gland, responds in some way to length of day to bring about hormone levels necessary for ovulation.

Apparently this is one way of insuring that the young are born during a period encouraging to maximum survival.

• Science News Letter, 78:88 August 6, 1960

METEOROLOGY

Tiros I Photographs Tornado-Producing Cloud

See Front Cover

A TORNADO-PRODUCING CLOUD had its picture taken by TIROS I, the United States meteorological satellite orbiting 400 miles above earth.

The possibility of a tornado-cloud picture is highly remote. The rare photograph, shown on the cover of this week's SCIENCE NEWS LETTER, was made on May 19, and was discovered by the Weather Bureau after a "painstaking analysis of the more than 20,000 photographs taken by TIROS in its operational lifetime."

The picture is a significant step forward in our efforts to understand and predict weather.

The rare exposure showed a bright square cloud in an otherwise cloudless part of the sky. The fact that this image was taken over the Southern Plains, where an area of heavy thunderstorm activity had been reported, prompted the Weather Bureau to determine whether the square cloud mass might represent the beginning of a severe weather system. The tornado is one of the smallest and most dangerous of all storms.

Comparison with other weather observation at the same time by meteorologists revealed that the "square" cloud was in a heavy thunderstorm area reported in Hobart, Okla., Childress and Wichita Falls, Texas.

The weather detectives also found strong evidence indicating that the tornado cloud mass later expanded and spread northeastward, leaving a trail of tornadoes and hail in central Oklahoma.

The discovery is considered a stroke of luck. David S. Johnson, head of the Weather Bureau's satellite section, cautioned that not every isolated cloud mass seen from a satellite will be a warning of severe weather. But the TIROS tornado shot indicates that in the future detection of unusual cloud masses will improve the meteorologist's ability to recognize and pinpoint impending small-scale severe weather situations.

• Science News Letter, 78:88 August 6, 1960

GENERAL SCIENCE

New National Science Foundation Program

AN EXPERIMENTAL PROGRAM of general grants designed to strengthen the scientific capability of the nation's colleges and universities has been announced by Dr. Alan T. Waterman, director of the National Science Foundation.

The grants will be given to the educational institutions without restriction for use and will complement Foundation support for specific science and science education projects.

"Federal support of research for particular projects, by earmarking funds for those projects, tends to handicap the institution in developing its over-all scientific capability," Dr. Waterman said.

The new program of institutional grants will enable the college or university to get necessary equipment, employ a needed instructor, technical assistant or specialist, acquire the data that "may make a great difference in the prompt solution of some difficult situation," Dr. Waterman explained.

Amount of grants to an institution will not exceed $50,000 for any one fiscal year. Generally they will be limited to five percent of the Foundation's research grant made to the institution in the previous year.

Although the institutions will be free to allocate the funds without restrictions, they will be required to report to the Foundation annually on how the funds have been expended and the purpose underlying the investment.

• Science News Letter, 78:88 August 6, 1960

METEOROLOGY

Cloud-Seeding Program Seeks Rain-Making Proof

ALTHOUGH THERE IS no conclusive evidence as yet, University of Arizona physicists are attempting to discover whether or not cloud-seeding has affected Arizona rainfall. The annual summer cloud-seeding program, started in 1957 in cooperation with the University of Chicago, is aimed at furnishing scientific proof that rain making is or is not possible through cloud-seeding. Two more summers of studying cloud-seeding results are expected to yield a definite answer about rain making.

• Science News Letter, 78:88 August 6, 1960

IN SCIEN

TECHNOLOGY

Nuclear Altimeter Being Built in Massachusetts

A NUCLEAR ALTIMETER is now being developed for the U. S. Army Ordnance Corps by Tracerlab at Waltham, Mass. It will differ from a conventional altimeter in that it will use nuclear "beta back-scatter" techniques for altitude sensing. These techniques are now used to measure the thicknes of material and for process control in industry.

In its airborne role, "beta back-scatter" will be used to sense atmospheric density at varying heights above the earth's surface. Because atmospheric density is related to height, the instrument will be able to give direct, accurate indications of altitude.

• Science News Letter, 78:88 August 6, 1960

VETERINARY MEDICINE

Parakeet Revived by Artificial Respiration

ARTIFICIAL RESPIRATION has proved its value once again—it even works on parakeets.

Dr. Sidney J. Michael, small-animal veterinarian of Erie, Pa., reports that a 10-year-old green parakeet was brought to his office for removal of a tumor on the right wing tip. In all other respects the bird appeared to be perfectly healthy.

The doctor gave a local anesthetic and removed a few feathers in the area to be operated. He had just turned to pick up some instruments when his assistant told him the bird was dead.

Dr. Michael reports:

"I took the bird in my hand and, to all appearances, it was completely lifeless. I lifted the bird to my ear and listened and I could hear its heart beat; the pulse was was relatively full and normal.

"Without much hope of reviving the bird, I performed manual artificial respiration with my index finger and thumb. Each exertion of pressure, at the rate of about twice a second, caused the bird to emit a more or less natural squeak."

The doctor then rigged up a parakeet-sized oxygen tent, and after about five to ten minutes of this combined treatment, "I felt one foot take hold of my finger." In a few minutes the parakeet patient blinked an eye, kicked his feet, wiggled his toes and shook his head. With a little more oxygen he regained consciousness, but was still a bit wobbly. In view of the bird's narrow escape, the doctor decided that it would be best to give no further treatment.

The next morning, Dr. Michael reports in the Journal of the American Veterinary Medical Association, 137:105, 1960, the bird was as chipper as if nothing had ever happened.

• Science News Letter, 78:88 August 6, 1960

NCE FIELDS

MEDICINE

Microscopic Liver Cells "Pan" for Gold in Blood

MICROSCOPIC CELLS in the liver, which "pan" for gold in the blood stream, are helping science to find out more about health and disease in the human body.

These microscopic gold miners collect a special "gold dust" deliberately injected into the body. The gold is in a very finely divided or colloidal state and is radioactively tagged.

The cells (named von Kuppfer after their discoverer) are amoeba-like cells located mainly in the liver and have the function of clearing debris from the blood stream. Thus they collect the radiogold as it comes through the liver.

Drs. George V. Taplin, Jane Hayashi, Delores Johnson and Earl Dove of the University of California Medical School, Los Angeles, are utilizing this property of the cells to study medical problems related to liver blood flow.

By tracing the radiogold as it leaves the blood and is taken up by the liver's von Kuppfer cells, the investigators are able to gauge liver blood flow.

The gold test is most useful in detecting impairment of liver blood supply, which occurs mainly in cirrhosis.

The gold procedure is used with another tracer test employing a radioactive dye, Rose Bengal, to diagnose liver disease. The Rose Bengal test measures the function of the liver's "chemical factory" (polygonal cells) provided one knows the blood supply of these cells is adequate. It also indicates bile duct obstruction (obstructive jaundice).

The two tests in combination help the physician to make a rapid and accurate diagnosis of the particular liver disorder and can even detect when two disorders occur simultaneously.

• Science News Letter, 78:89 August 6, 1960

BIOCHEMISTRY

Protein Coat Protects DNA From Radiation

THE REASON the nucleus of a body cell is more subject to radiation damage at certain times during cell division than at others may have been found by a team of British chemists.

The heredity-carrying chemical, deoxyribonucleic acid (DNA), is found in the cell's nucleus and is wrapped in a protein sheath. This protective jacket, the chemists found, acts as a cushion by absorbing a great deal of radiation, thus preventing penetration to the DNA.

However, during certain phases of cell division, the DNA sheds its protein coat and the radiation can go through unimpeded. It is at this time the radiation does the damage, which may be to cause a mutation or break up the DNA molecule.

For some time it has been known that DNA surrounded by water is rather easily destroyed by radiation. This is because the radiation causes a chemical reaction that forms radicals, which eventually rupture the hydrogen bonds in the DNA molecule.

In a more normal situation, where DNA is not directly in contact with water, it takes much more radiation to cause damage. In experiments with nucleoproteins from calf thymus glands, the chemists found that with doses up to as high as 100,000 rads, almost all the damaging radicals reacted with the protein and the DNA remained substantially undamaged.

In man, certain death results in two to eight weeks from a radiation dose of about 800 to 1,000 rads.

The research is reported in Nature, 187:319, 1960, by Drs. P. Emmerson, G. Scholes, D. H. Thomson, J. F. Ward and J. Weiss, all of King's College, University of Durham, at Newcastle upon Tyne.

• Science News Letter, 78:89 August 6, 1960

PSYCHOLOGY

New Booklet Advises On Mental Problems

DO'S AND DON'TS for giving assistance to troubled persons are offered in a new free booklet, "How to Deal With Mental Problems," issued jointly by the National Association for Mental Health and The Advertising Council.

Written by Harry Milt, the psychologist who is the association's director of public information, the booklet replaces "How to Deal With Your Tensions," by the same writer. More than 1,500,000 copies of the latter booklet have been distributed in the past three years.

Mr. Milt suggests a number of ways to be helpful to a person with emotional problems. These are the Do's:

1. Do let the person know you're interested and care.
2. Do be a good listener.
3. Do try to help out with some practical problems.
4. Do send for and read other literature.
5. Do get help from an expert, if necessary.

These are the Don'ts:

1. Don't set yourself up as a judge.
2. Don't tell him to calm down or "snap out of it."
3. Don't argue him down.
4. Don't, by any means, try to be an amateur psychiatrist.

It is estimated that about 17,000,000 persons in the United States (one out of ten, approximately) require professional attention for mental or emotional disorders that are serious.

Signs of emotional trouble include selfishness and greediness, helplessness and dependency, poor emotional control, day dreaming and fantasy and hypochondria. Persons who continuously have a chip on the shoulder, those who are excessively moody, anxious or suspicious, are very likely to be suffering from a mental illness.

• Science News Letter, 78:89 August 6, 1960

TECHNOLOGY

Convert Landing Vehicle To Gas Turbine Power

CONVERSION of a military amphibious landing craft to gas turbine power now underway will boost the craft's payload 5,000 pounds and its speed 30%, according to the General Electric Company. The total weight of the turbine engine-transmission package is under 3,200 pounds compared to the more than 6,500 pounds of equipment replaced. Space occupied by the turbine engine itself is only nine cubic feet, compared to 65 cubic feet for the reciprocating power plant.

• Science News Letter, 78:89 August 6, 1960

SOCIOLOGY

Boredom May Be Cause Of School Vandalism

A RASH OF VANDALISM may appear in your local public high school when:

1. Teachers and students alike are bored and have a couldn't-care-less attitude and the students' idea of school loyalty means only going to the school football games.
2. Students, teachers and parents do not get along with one another.
3. There are rapid or extensive changes in the school program, student body or the staff.
4. School administration and leadership are inadequate and both students and teachers are dissatisfied with them.
5. There is community instability and neighborhood deterioration.

These "signposts to vandalism" are based on answers to 1,170 student questionnaires, 387 teacher interviews and histories of 16 Syracuse public junior and senior high schools. The study was conducted by Dr. Nathan Goldman, Syracuse University professor of sociology, under contract with the U. S. Office of Education.

"The one condition most closely related to high property damage," Dr. Goldman found, "is alienation from or lack of identification with the school."

Good relationships among students, teachers and parents were found more often in low damage than in high damage schools. A strong democratic administration was also more characteristic of low damage schools.

• Science News Letter, 78:89 August 6, 1960

MEDICINE

AMA Says Hypnosis Is Not Good Sportsmanship

THE USE OF HYPNOSIS in athletics is dangerous and unsportsmanlike, two committees of the American Medical Association charged.

The use of hypnosis in athletics may aggravate physical impairments of which the athlete is unaware, according to the AMA Committee on Hypnosis and the Committee on the Medical Aspects of Sports.

• Science News Letter, 78:89 August 6, 1960

METEOROLOGY

Hurricane Season Here

From now through September the chances are high that one of the mighty tropical storms will slam into the United States mainland.

By ANN EWING

THE SEASON FOR HURRICANES is here. One of the giant storms has already slammed into Honduras and Guatemala.

Others, born in disturbances in the easterly winds at low altitudes, will churn northward and may hit the United States mainland.

Winds must reach a strength of at least 74 miles an hour for a tropical weather disturbance to be called a hurricane. Wind speeds of 150 miles an hour are quite common in hurricanes striking a coast.

From structural damage caused by winds, scientists have estimated that speeds may reach as high as 200 miles an hour.

However, it is not the high winds but the high water inundating coastal lands that causes most of the deaths and destruction from hurricanes. Inland, heavy rains may also flood rivers, especially in mountainous areas.

"Storm surges"—hurricane-caused rises in sea level—may be as much as 10 to 15 feet above normal tide. This rise above normal tide is due, among other factors, to the pile-up of water along the coast by continued onshore winds in advance of the storm and a build-up of a wave accompanying the storm center.

This storm wave is usually only two or three feet high over the ocean, and results from the lower barometric pressure at the hurricane's center. However, as the storm crosses a coastal line, the shoaling of the water may result in a build-up of the wave to a height several times that over the ocean.

Where Hurricanes Form

Hurricanes usually form over remote areas of tropical ocean, where warm air carries a heavy burden of moisture. Its violent whirling winds are set in motion when air is drained away from one area by currents in motion at high levels, causing pressure at the surface to fall. As air near the surface surges in toward the region of lower pressure, it is deflected by the earth's rotation into a spiraling path and rises.

The heavy rains that develop in the rising air release latent heat of condensation, the fuel the hurricane uses for its energy and growth.

Hurricanes move at an average rate of 12 to 15 miles an hour in the tropics. The rate of motion often increases to twice this amount, at times even reaching 60 miles an hour, when storms come out of the tropics and hit the U. S. coast.

The factors determining how and where a hurricane will move, and especially changes in path, are found mostly outside the storm itself. To forecast its motion, meteorologists study conditions far from the storm's center.

The farther in the future the forecast is made, the farther away from the storm meteorologists must look for the controlling factors. For a one-day prediction, observations within a thousand miles of the hurricane center will usually be sufficient. Weather events in the central and northern United States and in the higher altitudes of the Atlantic Ocean are of particular importance.

For a 48-hour forecast, current weather events in temperate and polar zones over the whole Pacific and Atlantic Oceans, in addition to North America, must be taken into account.

For periods of five days and longer, meteorologists are studying ways of prediction useful as a general guide of the hurricane's path. No scientific basis exists for predicting months in advance when and where a hurricane will form or enter the coast.

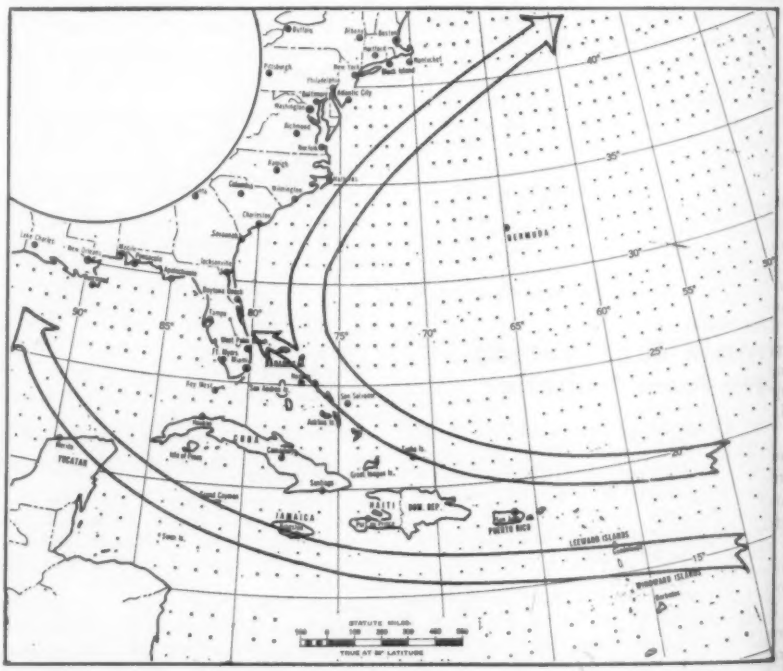
As soon as there are indications a hurricane is forming, no matter where, the storm is given a name and the U. S. Weather Bureau begins issuing "advisories." When the storm threatens the mainland, hurricane "watch" notices are included in the advisories, and gale and hurricane warnings are issued.

A hurricane's energy budget is impressive: A typical hurricane takes in about 20,000,000 tons of air every minute at its lower levels. This air rises swiftly and is thrown out at the top, some 40,000 feet above. The process is like an enormous wringer, squeezing moisture out of the air. The moisture condenses and produces heat energy at a rate equivalent to about 600 atom bombs, exploding every minute, Weather Bureau experts calculate.

Storm May Last Ten Days

A typical hurricane lasts about ten days, liberating heat by condensation of water in an amount equivalent to something like 10,000,000 atom bombs, enough to supply all the electrical needs of the United States for the next 600 years.

Trying to control such a storm is far beyond today's capabilities, Weather Bureau



HURRICANE TRACKING CHART—This map shows the areas where hurricanes are formed and the tracks they are likely to take. It gives a good over-all picture, but does not indicate any of the seasonal variations in the whirling storms' paths.

officials believe. There is hope, however, that by locating weak spots when the storm is in its formative stages, scientists might find some way to prevent the storm from growing or to change its path.

More methods than ever before will be used this season to study these mighty storms. The Weather Bureau will fly three especially equipped research planes into the raging winds and quiet "eye" of the hurricanes.

The aim of these flights is to gather more detailed information about the birth, growth and death of the tropical storms, which will aid in predicting the path of future storms.

Weather satellites, such as Explorer VII, rocket photography of the storms, hurricane beacons placed in the relatively calm "eye," and increasing numbers of powerful radar will also be used to study the hurricane.

Names of hurricanes for the 1960 season range from Abby to Winny. Starting this year, a list of four sets of names will be used in rotation, beginning with the first name in the group each year.

The 1960 names are, besides Abby and Winny, Brenda, Cleo, Donna, Ethel, Florence, Gladys, Hilda, Isbell, Janet, Katy, Lila, Molly, Nita, Odette, Paula, Roxie, Stella, Trudy, and Vesta.

For persons not familiar with hurricanes, including newcomers to Florida, the following safety precautions include those urged by the Weather Bureau as a guide to the action to be taken when warnings of an approaching hurricane are issued:

1. Keep your radio or television on and listen for latest Weather Bureau warnings and advisories. If power fails, use a battery-powered radio.

2. Pay no attention to rumors.

3. Get away from low-lying beaches or other locations that may be swept by high tides or storm waves. If passage to high ground is over a road likely to be underwater, leave early. Do not run the risk of being marooned.

4. If your house is out of danger from high tides and is well built, then it is probably the best place to weather the storm.

5. Be alert for high water in areas where streams or rivers may flood after heavy rains.

6. Board up windows or put storm shutters in place. When you board up, use good lumber securely fastened. Makeshift boarding may do more damage than none at all. Have strong bracing for outside doors.

7. Get in extra food, especially things that can be eaten without cooking or with very little preparation. Remember that electric power may be off and you may be without refrigeration or ordinary cooking facilities. If your house is strongly built, your preparations must include provision for neighbors who may call upon you for shelter.

8. If emergency cooking facilities are necessary, be sure they are in working order. Solid alcohol stoves are good for heating water.

9. Sterilize the bathtub, jugs, bottles, cooking utensils and fill with drinking water, since city water service and private pumps may be interrupted.

10. Have flashlight and/or other emergency lights in working condition and keep them handy.

11. Be sure to have gasoline in your car. If electric power is off, filling stations may not be able to operate pumps for several days.

12. Check on everything that might blow away or be torn loose. Garbage cans, garden tools, toys, signs, porch furniture, awnings and other objects become weapons of destruction in hurricane winds. Store them all inside if possible.

13. Be sure that a window or door can be opened on the side of the house opposite the one facing the wind. This is to prevent an explosion because of the pressure difference inside and outside. The door should be securely braced or tied open.

14. If the center, or "eye," of the storm passes directly over, there will be a lull in the wind lasting from a few minutes to half an hour or more. Stay in a safe place. If emergency repairs must be made outdoors during the lull, be quick. Remember the wind will return suddenly from the opposite direction, frequently with even greater violence.

15. BE CALM. Your ability to meet emergencies will inspire and help others.

• Science News Letter, 78:90 August 6, 1960

MEDICINE

Paraplegics Helped by Surgery and Antibiotics

PARAPLEGICS, persons with partial or complete paralysis of both legs, are being helped to normal lives today because of modern surgery, antibiotics and rehabilitation techniques.

A new Public Affairs Committee pamphlet, "Paraplegia: A Head, a Heart and Two Big Wheels," outlines recent "spectacular progress" in treating paraplegics. It was written by Jules Saltman in cooperation with the National Paraplegic Foundation.

Paraplegics are highly susceptible to disease, the pamphlet says. Especially their kidneys, bladders and other organs concerned with elimination may be affected.

Once a person's spine has been injured, a victim must be handled carefully on the way to the hospital. After early diagnosis, control of shock, repair of accompanying injuries, exploratory X-rays and possible traction (application of weight) in certain neck injuries, early treatment may include surgery.

Until a few years ago a paralytic had a short life. Today thousands of paraplegics are living active lives. They work, travel and drive cars with hand controls. One concern of wheelchair patients is to stop where accommodations are suitable, unimpeded by steps and with bathroom facilities not too cramped.

The family and social atmosphere for paraplegics should be one of mutual acceptance, without over-solicitude. Most paraplegics want to be treated like everyone else.

• Science News Letter, 78:91 August 6, 1960

AERONAUTICS

Fuel Tank Seen As Space Vehicle

AFTER THE fuel for launching men into space is used up, the astronauts could crawl into the empty fuel tank and use it for working quarters while in orbit, an engineer proposed.

Robert P. Haviland of General Electric Company said in Philadelphia that during ascent and descent the men would use a separate capsule. He proposed the novel satellite vehicle as a practical interim method of continuing space exploration with present rocket boosters and technology, until more powerful boosters capable of carrying larger payloads are developed.

Mr. Haviland envisions the fuel tank vehicle would be about 20 feet long and eight feet in diameter. Metallic items would be placed in the tank to serve as bed, chairs, tables, mountings for instruments and other required facilities. Equipment that could not be exposed to the fuel would be sealed in bays at the top of the tank, Mr. Haviland told members of the Air Force Association's Metropolitan Philadelphia Squadron.

The propellant tank could be used since the last stage of a missile goes into orbit with the payload. In Mr. Haviland's proposal, the payload would be a capsule where the astronauts would sit during the launching. The capsule would contain escape hatches as well as equipment for bringing the men back to earth safely in the event of a booster malfunction.

In orbit, the men would move to the empty fuel tank. Since it would not be practical for the tank section to re-enter because of its size the astronauts would return to the small capsule during re-entry into the earth's atmosphere. They would be protected from re-entry heat by a plastic shield similar to that now used in missile nose cones.

• Science News Letter, 78:91 August 6, 1960

MEDICINE

Live Polio Vaccine Successful in U. S. Tests

NOT A SINGLE CASE of polio has occurred in the Cincinnati area where 108,000 were vaccinated with a live polio vaccine and in Rochester, N. Y., where 150,000 were similarly protected, Dr. Albert B. Sabin of the University of Cincinnati's College of Medicine told the Fifth International Poliomyelitis Congress in Copenhagen.

This experiment demonstrates, Dr. Sabin told SCIENCE SERVICE, the safety of this kind of vaccine under the conditions of typical American cities.

Given proper leadership, Dr. Sabin believes, America could achieve as good results with live polio vaccine as in Soviet countries where such live vaccine has been used involving 80,000,000 people.

The widely used Salk vaccine in America is a killed virus vaccine.

• Science News Letter, 78:91 August 6, 1960

• Books of the Week •

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print priced at 95¢ or over, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ADVANCES IN ORGANIC CHEMISTRY AND RADIOCHEMISTRY, Vol. 2—H. J. Emeleus and A. G. Sharpe, Eds.—*Academic*, 392 p., illus., $12. This volume contains, among others, sections on organometallic compounds, stereochemistry of ionic solids, structures of compounds containing chains of sulfur atoms and mass spectrometry in nuclear chemistry.

BASIC CARRIER TELEPHONY—David Talley—*Rider*, 176 p., illus., $5.75, paper $4.25. Fundamental text for telephone and radio engineers as well as others in communications and electronics.

THE CAMERA TOURING GUIDE TO EUROPE—Compiled by the Editors, Overseas Correspondents and the Service Department of the Focal Press—*Ziff-Davis*, 176 p., illus., $2.95. A pocket encyclopedia with facts and tips on photography in a score of countries.

CIVIL AIR REGULATIONS FOR MECHANICS—Associated Aeronautical Staff—*Aero Pub., Inc.*, 15th ed., 152 p., $4.50, paper $2.95. Federal Aviation Agency regulations applicable to mechanics working on either the structural part or the engine of an aircraft.

COLOUR IN YOUR CAMERA: A book of colour photographs to show how to make colour photographs—Gosta Skoglund—*Ziff-Davis*, 168 p., 250 color illus., $6.95. Guide to film, camera or process for color photography with a beginner's section and a collection of tables summing up technical points and reference information.

DEVELOPMENTS IN INDUSTRIAL MICROBIOLOGY—Brinton M. Miller, Ed.—*Plenum Press*, 267 p., $7.50. Proceedings of the 16th general meeting of the Society of Industrial Microbiology, State College, Pa., 1959. Covers topics such as antitumor antibiotics, space age microbiology, deterioration of proteins, etc.

A DIRECT ENTRY TO ORGANIC CHEMISTRY—John Read—*Harper*, 268 p., paper, $1.45. An introduction to organic chemistry designed primarily for the layman and for the help of the college student.

DISCOVERERS OF THE NEW WORLD—Josef Berger with Lawrence C. Wroth—*American Heritage (Golden Press)*, 153 p., 154 illus., $3.50. An account for the young reader of the long succession of explorations to the New World.

THE HEART IN INDUSTRY—Leon J. Warshaw, Ed.—*Harper*, 677 p., $16. Reference work for the industrial physician and the private practioner.

HINTS AND KINKS FOR THE RADIO AMATEUR, Vol. 6—*The American Radio Relay League*—128 p., illus., paper, $1. Easy reference and practical suggestions for the radio amateur's workshop and station.

THE HORSE BOOK—John Rendel—*Arco Pub. Co.*, 144 p., illus., $2.50. For horse lovers of all ages. Discusses all breeds and presents rules and explanations of horse shows, illustrating each topic with photographs.

THE MEANING OF WILDERNESS TO SCIENCE: Proceedings, Sixth Biennial Wilderness Conference—David Brower, Ed.—*Sierra Club*, 129 p., $5.75. Contributions by experts in ecology from various parts of the world, exploring the values of wilderness in terms of their value to the fields of science.

MECHANICS AND PROPERTIES OF MATTER—Reginald J. Stephenson—*John Wiley*, 2nd ed., 367 p., illus., $7.50. Deals primarily with the problems involved in Newtonian mechanics. The author has included a new section called "An Introduction to the Legrange Equations."

METROPOLIS AND REGION—Otis Dudley Duncan and others—*Johns Hopkins*, 587 p., illus., $8.50. Compilation of information on, and analysis of, the metropolitan structure of the United States. A base for measuring changes that population growth and technological advances have brought in the structure of our economy.

THE MOBILE MANUAL FOR RADIO AMATEURS—*American Radio Relay League*, 2d. ed., 282 p., illus., paper, $2.50. A digest of QST articles on amateur mobile, emergency and portable equipment. Contains a large number of photographs and diagrams.

NUMBERS OLD AND NEW—Irving and Ruth Adler—*John Day*, 48 p., illus. by Peggy Adler, $2. Shows young children the fun and usefulness of numbers.

101 MORE WAYS TO USE YOUR SCOPE IN TV—Robert G. Middleton—*Howard W. Sams (Bobbs-Merrill)*, 160 p., illus., paper, $2.50. A second volume on the use of the oscilloscope in TV troubleshooting. It includes waveform tests for several TV circuits.

ONE MAN'S PLEASURE: A journal of the wilderness world — Hugh Fosburg — *William Morrow*, 191 p., illus., $4. The author's observations of and experiences with all forms of wildlife in the Adirondack Mountains.

PLANT MORPHOGENESIS—Edmund W. Sinnott—*McGraw-Hill*, 550 p., illus., $12.50. Brings together the various aspects of the subject into a reference book to help teachers develop courses in the field.

PLANT PATHOLOGY: An Advance Treatise Vol. 3. The Diseased Population Epidemic and Control—J. G. Horsfall and A. E. Dimond Eds.—*Academic*, 675 p., illus., $22. For the research worker.

PLASMA PHYSICS—J. G. Linhart—*North Holland Pub. Co. (Interscience)*, 278 p., $7. Study of the behavior of plasma in various fields of force, including an extensive index of literature on plasma physics.

A SHORT HISTORY OF CHEMISTRY—J. R Partington—*Harper*, 3d. ed., 415 p., illus., paper, $1.95. Changes have been made in this edition to take into account recent studies and a new section on the theory of valency has been added.

SURFACE AT THE POLE: The extraordinary voyages of the USS SKATE—James Calvert—*McGraw-Hill*, 220 p., illus., $4.75. The story of an atomic submarine and its famous voyages in 1958 and 1959, as told by the commander.

THINGS THAT SPIN: From Tops to Atoms—Irving and Ruth Adler—*John Day*, 48 p., illus., $2. Explains to the young reader six basic facts about tops and their relation to things that occur in our universe.

TWICE ACROSS NORTH AMERICA BY MOTORBOAT—John Edwin Hogg—*Ziff-Davis*, 209 p., illus., $4.95. About the problems and the joys of his transcontinental trips in 1925 and 1959.

THE TWO-WAY MIRROR: National Status in Foreign Students' Adjustment — Richard T. Morris with Oluf M. Davidsen—*Univ. of Minnesota Press*, 215 p., $4.50. The fifth in a series of monographs presenting the factors that exert the most influence upon the adjustment of foreign students to life in the United States.

WASHINGTON: A modern guide to the Nation's Capital—Michael Frome—*Doubleday*, 257 p., maps and illustrations by Stephen Kraft, $3.95. Gives the visitor or resident of Washington, D. C., helpful information on the life of the city, such as how to see a session of Congress or how to make a tour of Georgetown.

• Science News Letter, 78:92 August 6, 1960

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The oxygen scavenger, a free-flowing granular product, is placed in a small porous packet and attached to the inside wall of a package of dry milk or dry ice cream mix that is then hermetically sealed. Milk stored in this manner has shown a "gratifying" retention of flavor and taste the U. S. Army reports.

• Science News Letter, 78:92 August 6, 1960

Candidates on Science

(Continued from p. 83)

have replaced men digging with shovels and straining at heavy weights. And each advance—each more efficient machine—has not only increased production and raised our standard of living, but it has also improved drastically the hours and the conditions of labor. In an eight-hour day, five-day week, the modern worker produces more than twice as much as his grandfather did, working twelve hours a day, six days a week.

And there is no reason why the advances of the future—like those of the past—should not bring even greater changes, easing the conditions of labor, shortening hours, lightening work, and bringing new and cheaper and better products into every American home.

But if this vision of a stronger and more prosperous America is to become a reality—if automation is to be the key to a brighter future rather than the forerunner of economic distress—then labor and management and Government must work together to ease the inevitable dislocations and hardships which this new industrial revolution will bring. No one—especially labor—is opposed to economic progress. No one wants to work the old, back-breaking way if there is an easier way to do the job. No worker and no labor leader wants to stand in the way of America's economic growth. No one wants to keep his fellow worker from sharing the benefits of increased productivity. But our workers do want assurance that they will not be tossed on the scrap heap and forgotten like so many obsolete machines—that they will not be the neglected victims of industrial change, shut off from the new richness which their skill and labor has helped to create.

This, then, is the challenge to American leadership: to welcome and stimulate technological progress—with its promise of increasing productivity—while providing new jobs and new hope for the victims of industrial advance.

• Science News Letter, 78:83 August 6, 1960

PSYCHIATRY

Do Not Try to Jolly Suicidal Person

DO NOT TRY to jolly a deeply depressed person who is threatening suicide out of his "blues," Dr. Joseph Hirsh of Yeshiva University, New York, warns. Not only is argument or jollying ineffective, it may actually increase the person's depression and push him closer to suicide, he indicates.

Do not take lightly suicide threats, Dr. Hirsh warns. In a study of the history of a group of suicides, it was found that 68% had previously expressed suicidal ideas and 38% had specifically stated that they intended to kill themselves.

It is not wise to take lightly even what appears to be casual talk about suicide. The various fantasies and ideas, or more specific statements of intent should be taken with the utmost seriousness, Dr. Hirsh advises.

Psychiatrists have questioned the wisdom of putting the depressed person who is brooding about suicide into a mental hospital. Taking him away from his job and his home may make him desperate enough to turn his suicidal thoughts into suicide itself.

But neither should the mental hospital patient be prematurely discharged from the hospital. A number of depressed patients have killed themselves within eight months after discharge from a psychiatric hospital.

Suicide prevention and control should not be left entirely to the medical profession, Dr. Hirsh says in Mental Hygiene, 44:382, 1960.

"Suicide prevention is everyone's business, and the sooner the recognition that suicide is more than a final fact but a long process with many prominent and measurable antecedents, the greater is the likelihood that much can be done to prevent it."

Susceptibility to suicide is lowest among those who have strong family ties, church, work and community relationships. Single persons, the widowed and divorced generally have higher suicide rates than married people.

For persons in depression, the early morning hours may be critical from a suicidal point of view.

Suicide is rarely an impulsive, highly agitated, unpremeditated act. It is generally a well-defined, deliberate act.

• Science News Letter, 78:93 August 6, 1960

PSYCHOLOGY

Parents Love Children They Put in Institutions

PARENTS who put a retarded child in an institution love him just as much as those who keep him at home. Four completely different factors influence the institutionalization of retarded persons.

At a conference on scientific study of mental deficiency held in London, England, Dr. Gerhart Saenger, director of the Research Center of New York University's Graduate School of Public Administration and Social Service, presented the findings of a two-year study of factors influencing institutionalization of retarded persons in New York City. The study was released in Albany, N. Y., by Dr. Paul H. Hoch, New York State Commissioner of Mental Health.

The four factors are:

1. The degree of mental retardation. (All with an intelligence quotient of less than 20 are normally committed.)

2. The family income and racial background.

3. Family adequacy. (Conditions in substandard homes or slum areas often determine that a child shall be put in an institution.)

4. Adjustment of the retarded child to the community. (Sexual offenses were found to lead almost invariably to placement in an institution.)

One of the most significant findings of the study was the fact that parents do not love their retarded child less if they decide to send him to an institution.

• Science News Letter, 78:93 August 6, 1960

INVENTIONS

Automobile Owners Benefit from New Patents

AUTOMOBILE OWNERS and drivers may well profit by one of the 942 patents issued this week—a burglar alarm that may be placed anywhere in the car.

The burglar alarm, for which Otto C. Wehrig of Seguin, Texas, was awarded patent No. 2,946,867, is simple in design, consisting of a block of some material such as wood or plastic, two wires and a steel ball.

The block contains a funnel-shaped hole in the top that leads into a horizontal tube through the block. At the top of the funnel there is a ledge with a slight rim on the inside and a relatively high wall on the outside. Two parallel wires are set in the floor of the horizontal tube so they do not touch one another, and these are connected into the horn circuit.

To set the alarm, the steel ball is placed on the ledge at the top of the block. Unauthorized activity in the car will jolt the ball off the ledge so that it will drop through the funnel into the tube to form a contact between the two wires. The horn will sound and continue to do so until the steel ball is removed or the battery runs down.

• Science News Letter, 78:93 August 6, 1960

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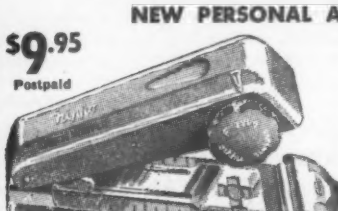

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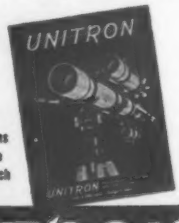

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CONSERVATION

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FISHING AND HUNTING, outdoor living opportunities expanded by Federal water resources projects, provide a better antidote for the stress of modern living than tranquilizer pills.

However, the availability of these preferred antidotes found in nature will depend in future years on action taken to protect fish and wildlife from being evicted from their natural habitat of water and land, the U. S. Fish and Wildlife Service warns in a report released by Sen. Robert S. Kerr (D.-Okla.), chairman of the Senate Committee on National Water Resources.

The report urges that fish and wildlife be given a greater share of the national water supplies, that animal conservation be given equal importance in water development projects (not just a by-product role), that research on fish and wildlife problems be increased and that the need for maximum production of salt water fish be recognized.

Citing the need to expand fishing and hunting opportunities, the report states that 25,000,000 Americans more than 11 years old spent 567,000,000 man-days and more than $3 billion in the pursuit of these sports in 1955. Within the next 20 years, it is estimated, 68,000,000 Americans will be spending 1,260 million man-days and $6.3 billion for these purposes if facilities are available.

At present there are more than 185,000,000 acre-feet of water available for fish and wildlife. This is more than enough to cover Texas a foot deep. By 1980, twice that amount will be necessary and by the year 2000, 465,000,000 acre-feet will be needed.

• Science News Letter, 78:94 August 6, 1960

Do You Know

Arthritis sufferers spend over $250,000,000 a year for misrepresented drugs, devices and treatments, most of which are worthless and unduly expensive.

Ocean sediment is deposited at a rate of one inch every 25,000 years.

Paraffin is cooked into *pencil wood* to keep the pencil from "frizzing" when it is sharpened.

Chromite is the principal ore for the production of ferrochromium, an alloying additive in steel and the production of pigments and chemicals.

The rate of *iron absorption* from the gastrointestinal tract is increased two to ten times during pregnancy.

With the new medicines and treatment now available, about 80% of the 1,500,000 *epileptics* in the United States are capable of holding regular jobs.

EDUCATION

Fair Winners Go to Berlin

FIVE BRIGHT EXAMPLES of American science fair winners will star in the U. S. Government exhibit at the Berlin Industries Fair in September, the U. S. Information Agency has announced.

These young scientists from Alabama, Colorado, Indiana, Michigan and Washington, four of them National Science Fair-International finalists this year, will be part of a galaxy of 30 outstanding high school students selected from all over the country. They will go to the West Berlin Industries Fair to participate in the U. S. Government's entry, "American Youth," designed to show about a million visitors how American young people live, learn, work and spend their leisure time.

Displaying and discussing their science fair projects, the high school scientists will give visitors a glimpse of the contributions to scientific development that may be expected from the younger generation.

David J. Wilson Jr., 18, of Athens, Ala., will exhibit his prize winning "Survival on Mars" project, consisting of a complete system that permits survival of animals on another planet. James K. Bramblett, 17, of Lafayette, Ind., will demonstrate his ultraviolet flying spot microscope, which scans living cells and produces a picture on a monitor tube.

Philip C. Bockman, 18, of Grand Rapids, Mich., and Martin J. Murphy Jr., 17, of Colorado Springs, Colo., will explain their ventures into medical science. Philip has devised a stainless steel and plastic sponge prosthesis that improves the connection with muscle and attachment to bone, and Martin has studied the biochemical role of radioactive testosterone in the formation of red blood cells.

Selected for the Berlin trip through SCIENCE SERVICE, which conducts the National Science Fair-International, these four boys were chosen from among those who won distinction at the annual event. In Indianapolis last spring the Fair judges and those of cooperating Government and professional groups awarded these students a variety of high honors.

Sharon Perkins, 15, representing the winners of the Inland Empire Science Fair, Spokane, Wash., an affiliate of the National Science Fair-International, will round out the view of youthful scientists-in-action. Her project is a geodesic dome constructed of novel material.

The 30 will arrive in Washington, D. C., on Aug. 21 for a nine-day orientation course. They will fly to Europe about Aug. 30 and will continue their training sessions in language and history until the opening of the Fair on Sept. 13. They will return to the United States, and their high school and freshman college classes, on Sept. 28.

The U. S. Information Agency has developed the exhibit for the Industrial Fair in cooperation with the Department of Commerce for the President's Special International Program. Educational, civic and business groups are helping to send the students, and the National 4-H Club Foundation is supervising their travel, administrative and financial arrangements.

• Science News Letter, 78:95 August 6, 1960

Questions

MEDICINE—How is the lie detector being used medically? p. 84.

METEOROLOGY—How long does a hurricane usually last? p. 90.

PUBLIC HEALTH—Where will the world's first Department of Radiological Science be located? p. 82.

TECHNOLOGY—How can dry milk flavor be retained during storage? p. 92.

Photographs: Cover and p. 90, U. S. Weather Bureau; p. 85, Linde Co.; p. 86, University of Illinois; p. 87, Vision Magazine—Richard Davis; p. 96, The Giamporcaro Co.

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GARDEN SPRAYER eliminates tiresome pumping, yet guarantees accuracy of the solution mixture being used. The tank-type sprayer operates on pressure of a home water system. Enough force is generated to deliver a spray in a fine mist or stream of liquid up to a distance of 60 feet.

• Science News Letter, 78:96 August 6, 1960

FURNITURE POLISHING CLOTH takes the work out of dusting. Waxes and silicones are in the cloth, and it dusts and polishes with one wiping. The cloth is washable and can be used over and over again to clean, polish and protect any wood surface.

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MATCHED TOOLS are a set of three individual portable electric workshop tools —drill, sander and jig saw. The three come in a polystyrene crib with exactly fitted spaces for safe storage of the tools and accessories such as drill bits, saw blades, jig saw table, sander sheets and buffing pads.

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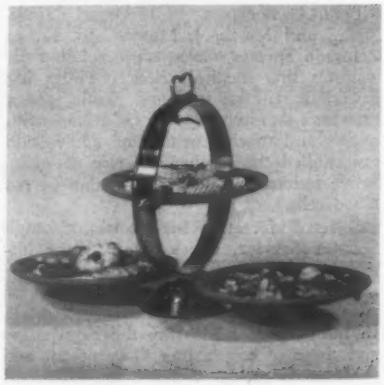
FOLDING NUT-FRUIT TRAY, shown in the photograph, is made of hand-carved walnut wood, imported from India. Encircled in gleaming brass, it is designed for



serving fruit, nuts, candy and appetizers. When open, the tray stands 10 inches high, 15¼ inches wide; folded, it is an attractive ornament.

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LIQUID PICTURE DUPLICATOR will duplicate any illustration—a magazine cover, a work of art—in minutes and transfer it in full color to any material. Just brush on the special formula, soak it in hot water, transfer the resulting film to book covers, sweaters, lamp bases, and many other surfaces.

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FACE-FITTING ELECTRIC RAZOR has floating heads designed to give a smoother, more comfortable shave. It is said to be the first contour razor, as its heads "float" to fit the contour of the face. The shaver also has a voltage adjustor that makes it usable almost anywhere.

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METAL CAR KITS permit construction of models of famous cars. Long-lasting and durable, the completed model can be finished in automotive lacquers. Each kit contains a die cast body, chassis, running gear, detailed motor block, plastic seats, accessories and other realistic parts.

• Science News Letter, 78:96 August 6, 1960

LIQUID LOCK WASHER secures nuts, bolts and screws. One drop of the new sealant will tighten and lock any new or worn threaded connection on metal or wood fasteners. Applied where nut meets bolt or screw meets wood, it forms a tough plastic bond, preventing "fall-out" of nuts, bolts and wood screws.

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Nature Ramblings

By HORACE LOFTIN

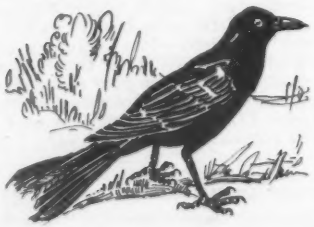
IT WAS ONLY a few short weeks or even days ago that every tree seemed to have its pair of nesting song birds. Music filled the early summer air as the males tunefully proclaimed their territories. Wings flashed everywhere as busy parents hunted food for their demanding offspring. Then the fledglings appeared, swelling the ranks of the birds for a while.

But now, over much of the nation, the birds are relatively scarce, except for some summer-flocking species. The midsummer stillness is seldom broken by song. The nests are empty. The birds that are seen are furtive and listless by comparison with their springtime ways. Even their coats appear ragged and bedraggled.

For most species, the breeding season is over. This generally means the break-up of mating pairs. Territories have been abandoned and so has the territorial song.

A few "early" birds—probably those that were unsuccessful in nesting—start soon for their wintering grounds. Several rec-

Where Are the Birds?



ords of northern-breeding song birds were made in Florida as early as late June this year.

The birds that remain north later in the summer may be solitary wanderers or they may join others of their kind for a post-nesting fling. It is common among many species for the males and females to form separate flocks and to make their southward migrations separately. The young birds may form their own flocks and are often among the latest migrants.

All of our birds have a complete molting of feathers at least once a year, the period following breeding. As old feathers are shed for new ones, the birds seek privacy for the change. It is during the period of molting that many species keep to the deepest shadows and thickets. For some, such as the starling, this "post-nuptial" molt is the only major feather change during the annual cycle.

Other birds have a "nuptial" molt in spring, by which the male gains his showy breeding plumage. But this bright coat is invariably lost in late summer or fall. The ptarmigan, with three or even four molts per year, is more or less in the process of replacing its plumage all year long.

Late in the summer you may hear a half-hearted song once more from a springtime singing post. With some birds, such as the mocking bird, there is a brief reawakening of the urge to sing with the approach of fall. But this is short-lived and, like summer itself, will soon fade away.

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$5.